

# Zabbix at Nokia

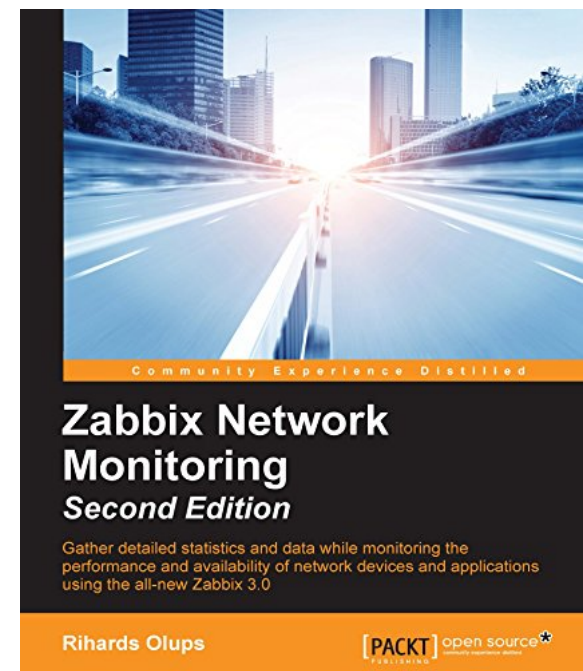
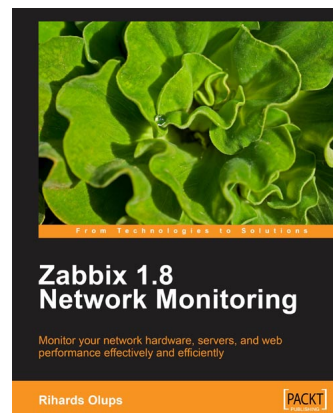
September 9-10, Zabbix Conference  
Riga, Latvia

# About the Speaker

Using Zabbix since 2001

Pleasure to work with the Zabbix team for 5+ years

A couple of books on Zabbix



# Who We Were

3310

Falls to the floor



Break the screen

Falls to the floor



Break the floor



# Who We Are

Telecommunication and infrastructure

Hardware and software

# What We Use

Zabbix at (a single division of) Nokia

Not just Zabbix – a lot of different solutions

Not an endorsement

# What We Have

Zabbix 2.4 instance, production

Zabbix 2.4 instance, testing

Zabbix 2.4 instance, development

Zabbix 2.2, production

...these are the "new" systems

# What We Still Have

Zabbix 1.8, production

... x 2

Also, agents



THAT OLD !>!!??1111one

"We released version n 3 months ago, WHY  
HAVEN'T THEY UPGRADED YET ?"

"But the new version has nnnnnn..."

"\_\_\_\_FILL\_IN\_\_\_\_"

# The Reasons

Reason 1: the rule of .4

Reason 2: if it works...

Reason 3: it's complicated

# There's More

A few more Zabbix instances

Various versions

Planning to deploy 3.0 – cutting edge

# Backend

Oracle for 1.8

MySQL/MariaDB for anything after that

Main reasons:

- Licencing
- Reliability (sharing the database)

# Important Building Blocks

Scripts to collect the data

API-using tools

JMX (Java is popular – why?)

# The Three (Main) Topics

The experience of upgrading Zabbix

Other trouble

Suggested practice and solutions

# Upgrading 1.8 to 2.4

Why do companies sit on old releases?

Upgrading is an effort.

# Something Breaks

Investigation starts

- There are items
- Items stopped getting data
- Person who wrote this has moved on



# When Something Breaks

Have to figure out:

- What does it do
- How to fix it
- Before that – where the hell is it

# One Example of an API-using Script

"user.authenticate" method removed

'auth' not allowed in user.login

item "description" changed to "name"

"exists" methods removed

"&|" changed to "and or"

zabbix\_sender changed "failed 0" to "failed: 0;"

# Solved All That?

Still fails against one of the "new" systems

Remember, one of them was still 2.2

...so "&|" needed instead of "and or"

# Three

Three cases:

- Old API, sender
- New API, sender + "& |"
- New API, sender + "and or"

# Click Me

Links in alert emails – 3 versions again:

- 1.8 – patched version to show graph
- 2.2 – `history.php?itemid=`
- 2.4 – `history.php?itemids[ ]=`

# Java GW Trouble

Java GW 2.0 – patched (endpoints, ports)  
2.0 never times out, no time to forward-port  
Solution – a remote command to restart...

# Zabbix Server Trouble

Didn't use a feature before

Started using it, server crashes

Have an action on another Zabbix server to restart this one ->

- **WORKSFORME**

(that server was upgraded quickly, though)

# More Inter-version Template Fun

Have an updated template in 2.4

Import it in 2.2. Fail.

- Change "and or" back to "& |"
- ...remember to use the HTML entity
- Change some more
- Did they use spaces? Where they updated?
- ...dependencies



# Migrating Users

Get their media, too – API method `user.get`  
...doesn't return media in 1.8

DB it is

# The Great Things When Upgrading

It's the little things

- Usability
- Links
- Maintainability

# What We Notice

Newlines in trigger expressions

Links, links, links

- Link in simple graphs lost in 3.0...

**Death to the dropdowns**

Split users/groups in the administration section

# The Non-shiny

Change design? The overworked peasant never notices. Used to "enterprise" design.

Runtime loglevel changing? A lifesaver.

Less bugs. Really.

Human-friendly errors. Or any at all.



# Upgrading to 3.0

...

...

eh ?

# Templates and Upgrading to 3.0

Import a template that uses SNMP LLD

Get burnt

ZBX-10758

- XML import does not convert SNMP LLD rule

# It's Not Perfect

The cynical doctor – "can you get to the door?"  
...more like "got pimples? well, live with it"

# Discovering Trouble

Network discovery script, returns tags

Rewritten, some tags reused

Misconfigured discovery ->

- all messed up (not getting away with it)
- audit not helpful



# Action Fun

No built-in way to test actions

Create a trapper item+trigger

Limit an action to that single trigger

## ...Is Actionable

Successfully test the action

Delete test item & trigger

Email saying it's all good now

# Action Trouble Is Here

What's wrong?

Action got silently disabled

[https://github.com/whosgonna/Zabbix-Tiny.pm/blob/master/examples/example\\_check\\_action\\_by\\_id.pl](https://github.com/whosgonna/Zabbix-Tiny.pm/blob/master/examples/example_check_action_by_id.pl)

# New Item Not Working

...no, just the oldest value[s] missing

<https://support.zabbix.com/browse/ZBX-9236>

# Graph Says It's All Good

Something alerts

Check the graph – straight line at 1, all good

...it's a trapper item

# My Favourite Things

Monitoring -> Triggers

...made nearly useless by new triggers blinking

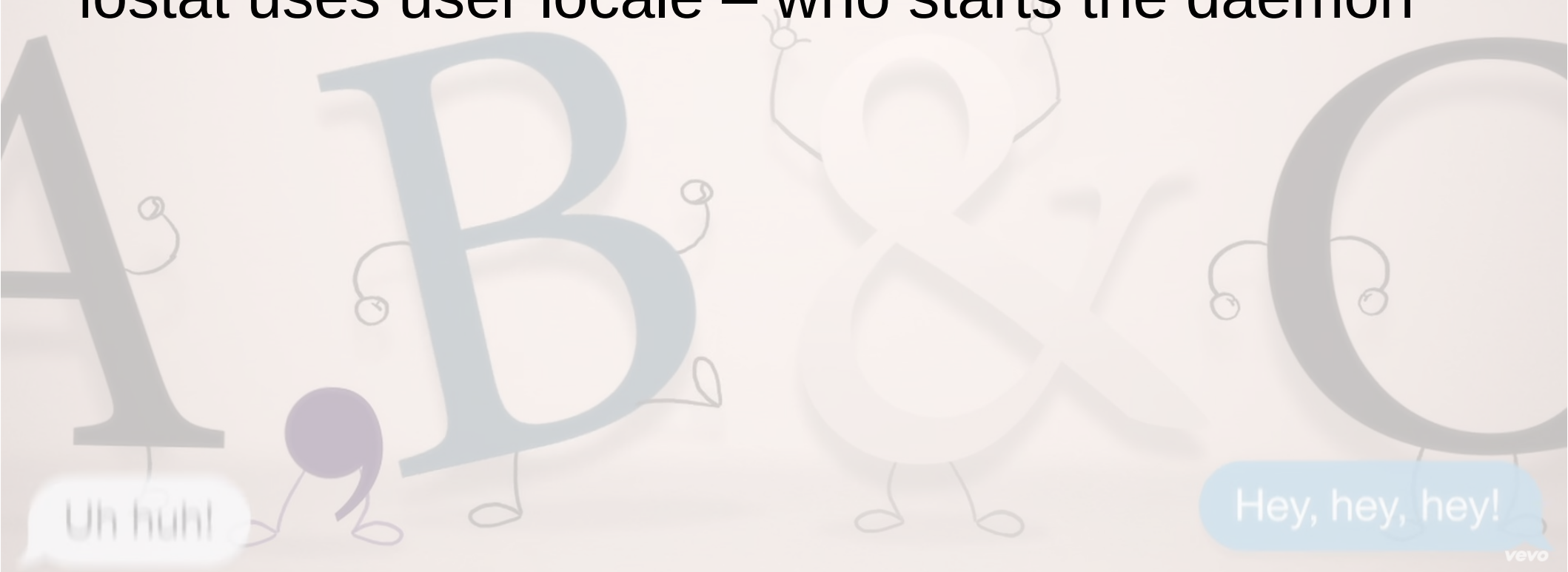
ZBX-7559 (single 'ok' event considered as a change)

# That Comma

Suddenly items start failing

Value 82,82 not supported for float

iostat uses user locale – who starts the daemon



UPGRADING

PROBLEMS

SOLUTIONS

# And You, curl

The same with curl

- `$ curl -s -w '%{time_total} - %{speed_download}\n' www.zabbix.com -o /dev/null`
- 0,701 – 55300,000

Initscripts or external checks/userparams



# The Silence of Triggers

Scripts break, items get misconfigured

We get no alerts. Review unsupported items.

3.2 will be one hell of a time... but better

# nodata() on Unsupported

<q1x> HALLEHLUJAH

<volter> Oh yes!

<Silvery> finally

# When Scripts Roam Free

Lockfiles not being removed

...just monitor for that

UserParameter=vfs.files.older\_than[\*],find "\$1" -ctime +\$2 | wc -l

# A (Quite) Rocky Horror Picture Show

Can't migrate template from newer -> older

Redo manually, forget the LLD filter

Get hundreds of thousands of items

- On a busy DB server

# Services + Ports

Multiple JVMs or any other service

Often just a single port/item

Template proliferation

Items

[Items](#) (31)

[Items](#) (32)

[Items](#) (31)

[Items](#) (32)

[Items](#) (34)

[Items](#) (31)

# Multiple JVMs

Several JVMs on same host – a problem

- Patched Java GW
- Separate hosts
- Works out better maintenance-wise

# Scripting the API

Creating items, triggers

Generating graphs and screens

General maintenance (users, host groups)

# API Scripts

Weird load on Zabbix, triggers deleted/created

Function *get\_trigger\_id* unconditionally deletes the trigger

Check your scripts, including logout



# API Issues

New users are obliterated by validation/error messages

Missing functionality – but gets better

API mostly works in recent versions

# Audit Log

Many operations not recorded

Significant issue with many admin users

# Syncing the Templates

Needed the templates to be the same across 5 Zabbix servers

Manual syncing

Looking into the API – after decommissioning 1.8

# The Daily WTF

These problems weren't massive

But the small problems eat your time

Death by a thousand typos

# ONCALL

Fueled by Zabbix notifications

A surprise of "Latest 20 issues" in the dashboard

Can't reorder elements in 1.8

- ...do collapsed elements still load data?

# Supports Other Decisions

Something's down

Software acting weird

Capacity planning

# Don't Use /

Data transfer on / can indicate problems

- Misconfiguraton
- Somebody outputing to /

Added special monitoring on Solaris DB servers

# SSSSolaris

## Discover partitions along their mountpoints

- 'join' can hang, 'awk' versions...

```
#!/bin/bash
while read partitionlongid partitionid mountpoint fstype; do
partitionlist="$partitionlist,"{"{#PARTITIONID}":"$partitionid","{#PARTITIONLONGID}":"$partitionlongid","{#FSTYPE}":"$fstype","{#MOUNTPOINT}":"$mountpoint"}'
done < <(/usr/xpg4/bin/awk '(NR == FNR){i[$1] = $2; n[$1] = $3; next}{print $1, $2, i[$1], n[$1]}' <(mount -p | /usr/xpg4/bin/awk '{sub(".*/", "", $1); sub("s0$", "", $1); print $1, $3, $4}')
<(paste -d" " <(iostat -xn | awk '{print $NF}') <(iostat -x | awk '{print $1}') | tail +3))

echo '{"data":['${partitionlist#},']}'
```



# Have Guardrails

Write basic guidelines

[http://zabbix.org/wiki/Docs/template\\_guidelines](http://zabbix.org/wiki/Docs/template_guidelines)

It's easy to forget basics like usermacros

# Paint Them Your Style

All triggers must have comments

Don't make triggers fire upon "it got worse"

Avoid cronjobs to feed data

- [http://zabbix.org/wiki/Escaping\\_timeouts\\_with\\_atd](http://zabbix.org/wiki/Escaping_timeouts_with_atd)

# Trigger This

Most triggers are very simple

Some are so complex nobody understands them

This presentation resulted in a few triggers getting fixed

# Be Reasonable

Don't monitor what you don't need

- ...or monitor it infrequently
- ...and have triggers on it

It can reveal problems in an unexpected way

# Shots in the Dark

CPU load alone can expose a lot

I/O load / iowait

It can also be used in unintended ways

# For Your Own Safety

A file must be owned by root, permissions 100

World-readable on some systems

Userparameter for owner/permissions

# SSL/TLS Certs

You want to renew them on time

There are a lot of certs

Monitor them all

```
#!/bin/bash
```

```
date -d "$(echo | openssl s_client -connect "$1":"$2" 2>/dev/null | \
openssl x509 -noout -enddate | sed 's/^notAfter=//')" "+%s"
```

# How We Alert on Expiry

An alert goes out

- 60 days in advance
- 30 days in advance
- 15 days in... advance



# Hooking Into the DB

Maintaining maintenance

Acknowledging things

Acknowledging all on host missing in the frontend

# Try Not to Assume

Never assume others see what you see

Zabbix links are no good

Copy Zabbix graphs

# Simple Minded

MySQL monitoring that's simple, robust, lightweight...

Dump ***show variables;*** and ***vfs.file.regexp***

```
UserParameter=mysql.table.discovery[*],for table in $(mysql $1 -Ne  
"show tables;"); do tablelist="$tablelist,"{"{#TABLE}":"$table"}"; done;  
echo '{"data":['${tablelist#},']}'
```

+ default MySQL table size userparameter

# No Sharing

Do not share monitoring DB with production

- ...or testing, or QA, or whatever

We woke up IT, network guys, before we figured out that one system was hammering the shared DB

# If You Share Your Monitoring DB...

...monitoring will get broken when you already have other trouble

Which is exactly when you want a reliable monitoring

# Glad You Solved It. Now Maintain It

Don't modify the product too much

Maintenance costs are higher than implementation

# KISS

Simple is good

Documented is better

"Perfect is the enemy of good"

# Nirvana Fallacy

When you never even begin an important task because you feel reaching perfection is too hard



# A Pretty Fly

*"If you never miss a plane, you're spending too much time at the airport"*

*Economist George Stigler*

# Explain and Document

False "job security" – you never get promoted

Two Zabbix script repos

- Some people work on one, some on another

# Break Stuff

How can a webpage testing script fail?

- Connection fails
- Unexpected content
- Never times out

# It Takes Time

Solving a problem is often easy

Solving it properly is hard

- Handle all the edge cases, write comments
- Accept named parameters
- Have some debug output
- ...

if you pay attention, nothing is simple  
to explain anything, reduce it to simple

# Wild West

Wild West people rush in, save the day, get the fame

Poor peasants try to maintain that

Don't allow that to happen

# Maintenance Is the King

Low maintenance cost makes Java popular

Neat but complicated will be thrown out in favour of simple and robust (easy to maintain)

- Documentation can help a bit

# Usability

Surprise topic

Based on comments people make about Zabbix

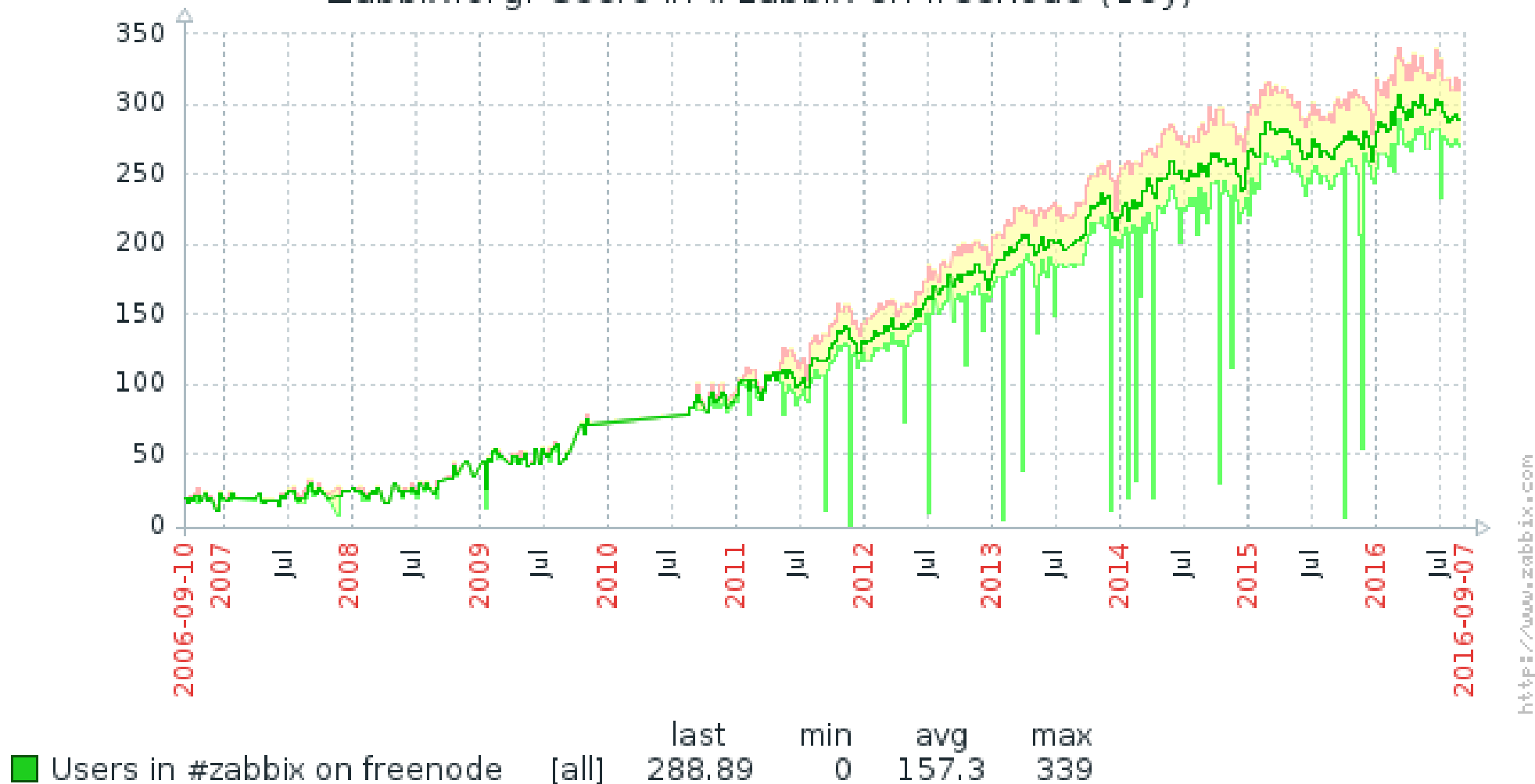


# It's Very Decent

<*DXManiac*> I tell people here at the office almost daily "Yes, the UI is cluttered and things are complicated, but I wouldn't know how to cram so many features in such a small place in any better way" :)

# You Better You Bet

Zabbix.org: Users in #zabbix on freenode (10y)



Data from trends. Generated in 0.24 sec.

# Zabbix Has These Issues, But...

<fracklen> But on the other hand - zabbix does have the feel of being well mature  
<fracklen> and a great community

# No Surprises

Zabbix positions itself as an enterprise solution

Enterprises want predictability

Knowing about changes in detail and in advance  
can spare painful surprises

# What's Important?

Built-in data gathering support less important than:

- Input data fits the Zabbix data model
- Core system is functional, stable, easy to debug
- Healthy, transparent development

# Thank You

Zabbix team for building it

Participants of this great conference

Zabbix community

The conference team